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CLAIMS

1. A recording method for instructing a drive apparatus having a pseudo-overwrite function to write data on a write-once disc, the write-once disc including a plurality of tracks,

the recording method comprising the steps of:

(a) receiving a write request which specifies at least data for a file to be written;

(b) instructing the drive apparatus to read a file entry of a metadata file which contains metadata for managing the file from a location of the write-once disc, so as to obtain the file entry of the metadata file;

(c) obtaining track information indicating a location of each of the plurality of tracks;

(d) determining a track from the plurality of tracks in which metadata is to be written next, based on the file entry of the metadata file and the track information;

(e) instructing the drive apparatus to read the metadata from a location of the write-once disc, so as to obtain the metadata;

(f) obtaining a next writable address indicating a location at which data is to be written next within a track other than the track determined in the step (d), the track being selected from the plurality of tracks;

(g) updating the metadata to reflect the writing of the data specified by the write request;

(h) instructing the drive apparatus to write the data specified by the write request to a location indicated by the next writable address in the write-once disc; and

(i) instructing the drive apparatus to write at least a part of the updated metadata to the location from which the metadata is read in the step (e) in the write-once disc.

2. A recording method according to claim 1, further comprising the steps of:

determining whether or not a next writable address within the track determined in the step (d) is valid; and

when it is determined that the next writable address within the track determined in the step (d) is not valid, instructing the drive apparatus to allocate a first track in which metadata is to be written next and a second track in which data is to be written next, and updating the next writable address obtained in the step (f) to a next writable address within the second track.

3. A recording method according to claim 2,wherein the first track and the second track are allocated within the track selected in the step (f).

4. A recording method according to claim 2, further comprising the steps of:

instructing the drive apparatus to write at least a part of the updated metadata at a location indicated by a next writable address within the first track;

determining whether or not the first track is allocated and at least the part of the updated metadata is written in the first track; and

when it is determined that the first track is allocated and at least the part of the updated metadata is written in the first track, updating the file entry of the metadata file to reflect the writing of at least the part of the updated metadata, and instructing the drive apparatus to write the updated file entry of the metadata file at the location from which the file entry of the metadata file is read in the step (b) in the write-once disc.

5. A system controller for instructing a drive apparatus having a pseudo-overwrite function to write data on a write-once disc, the write-once disc including a plurality of tracks,

the system controller comprising a controller for controlling the drive apparatus,

wherein the controller is configured to perform a process including the steps of:

(a) receiving a write request which specifies at least data for a

file to be written;

(b) instructing the drive apparatus to read a file entry of a metadata file which contains metadata for managing the file from a location of the write-once disc, so as to obtain the file entry of the metadata file;

5   (c) obtaining track information indicating a location of each of the plurality of tracks;

(d) determining a track from the plurality of tracks in which metadata is to be written next, based on the file entry of the metadata file and the track information;

10   (e) instructing the drive apparatus to read the metadata from a location of the write-once disc, so as to obtain the metadata;

(f) obtaining a next writable address indicating a location at which data is to be written next within a track other than the track determined in the step (d), the track being selected from the plurality of
15   tracks;

(g) updating the metadata to reflect the writing of the data specified by the write request;

(h) instructing the drive apparatus to write the data specified by the write request to a location indicated by the next writable address in the
20   write-once disc; and

(i) instructing the drive apparatus to write at least a part of the updated metadata at the location from which the metadata is read in the step (e) in the write-once disc.

25   6. A system controller according to claim 5, wherein the controller includes a semiconductor integrated circuit.

7. A program for use in a system controller for instructing a drive apparatus having a pseudo-overwrite function to write data on a write-once disc, the
30   write-once disc including a plurality of tracks,

wherein the program is configured to perform a process including the steps of:

(a) receiving a write request which specifies at least data for a

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file to be written;

  (b) instructing the drive apparatus to read a file entry of a metadata file which contains metadata for managing the file from a location of the write-once disc, so as to obtain the file entry of the metadata file;

5   (c) obtaining track information indicating a location of each of the plurality of tracks;

  (d) determining a track from the plurality of tracks in which metadata is to be written next, based on the file entry of the metadata file and the track information;

10   (e) instructing the drive apparatus to read the metadata from a location of the write-once disc, so as to obtain the metadata;

  (f) obtaining a next writable address indicating a location at which data is to be written next within a track other than the track determined in the step (d), the track being selected from the plurality of

15 tracks;

  (g) updating the metadata to reflect the writing of the data specified by the write request;

  (h) instructing the drive apparatus to write the data specified by the write request to a location indicated by the next writable address in the

20 write-once disc; and

  (i) instructing the drive apparatus to write at least a part of the updated metadata at the location from which the metadata is read in the step (e) in the write-once disc.

25 8. A recording method for writing data on a write-once disc,

  the write-once disc having a plurality of physical sectors, the write-once disc including a volume space having a plurality of logical sectors, each of the plurality of logical sectors corresponding to one of the plurality of physical sectors, the write-once disc having a plurality of tracks,

30 each of the plurality of tracks including at least one physical sector of the plurality of physical sectors,

  the recording method comprising the steps of:

  (a) receiving a write instruction which specifies at least a logical

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sector in which data is to be written;

(b) obtaining track information indicating a location of each of the plurality of tracks;

(c) determining a track from the plurality of tracks in which data is to be written next, based on the logical sector specified by the write instruction and the track information obtained in the step (b);

(d) determining whether or not the logical sector specified by the write instruction corresponds to a recorded physical sector or an unrecorded physical sector;

(e) when it is determined that the logical sector specified by the write instruction corresponds to an unrecorded physical sector, writing the data into the unrecorded physical sector; and

(f) when it is determined that the logical sector specified by the write instruction corresponds to a recorded physical sector, writing the data into a physical sector indicated by a next writable address within the track determined in the step (c), generating a remapping table including remapping information which remaps an original address of the recorded physical sector to a remapping address of the physical sector indicated by the next writable address, and writing the remapping table on the write-once disc.

9. A recording method according to claim 8, further comprising the steps of:

receiving an allocation instruction;

allocating at least one track in response to the allocation instruction.

10. A recording method according to claim 9, wherein the step of allocating at least one track includes a step of allocating a first track and a second track within the track determined in the step (c).

11. A drive apparatus for writing data on a write-once disc,

the write-once disc having a plurality of physical sectors, the write-once disc including a volume space having a plurality of logical

sectors, each of the plurality of logical sectors corresponding to one of the plurality of physical sectors, the write-once disc having a plurality of tracks, each of the plurality of tracks including at least one physical sector of the plurality of physical sectors,

5   the drive apparatus comprising:

a drive mechanism for performing a recording operation for the write-once disc; and

a drive control section for controlling the drive mechanism,

wherein the drive control section is operable to perform a

10   process including the steps of:

(a) receiving a write instruction which specifies at least a logical sector in which data is to be written;

(b) obtaining track information indicating a location of each of the plurality of tracks;

15   (c) determining a track from the plurality of tracks in which data is to be written next, based on the logical sector specified by the write instruction and the track information obtained in the step (b);

(d) determining whether or not the logical sector specified by the write instruction corresponds to a recorded physical sector or an

20   unrecorded physical sector;

(e) when it is determined that the logical sector specified by the write instruction corresponds to an unrecorded physical sector, controlling the drive mechanism to write the data into the unrecorded physical sector; and

25   (f) when it is determined that the logical sector specified by the write instruction corresponds to a recorded physical sector, controlling the drive mechanism to write the data into a physical sector indicated by a next writable address within the track determined in the step (c), generating a remapping table including remapping information which remaps an original

30   address of the recorded physical sector to a remapping address of the physical sector indicated by the next writable address, and controlling the drive mechanism to write the remapping table on the write-once disc.

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12. A semiconductor integrated circuit for use in a drive apparatus for writing data on a write-once disc,

 the write-once disc having a plurality of physical sectors, the write-once disc including a volume space having a plurality of logical
5 sectors, each of the plurality of logical sectors corresponding to one of the plurality of physical sectors, the write-once disc having a plurality of tracks, each of the plurality of tracks including at least one physical sector of the plurality of physical sectors,

 wherein the semiconductor integrated circuit is configured to
10 control a drive mechanism for performing a recording operation for the write-once disc,

 the semiconductor integrated circuit is operable to perform a process including the steps of:

 (a) receiving a write instruction which specifies at least a logical
15 sector in which data is to be written;

 (b) obtaining track information indicating a location of each of the plurality of tracks;

 (c) determining a track from the plurality of tracks in which data is to be written next, based on the logical sector specified by the write
20 instruction and the track information obtained in the step (b);

 (d) determining whether or not the logical sector specified by the write instruction corresponds to a recorded physical sector or an unrecorded physical sector;

 (e) when it is determined that the logical sector specified by the
25 write instruction corresponds to an unrecorded physical sector, controlling the drive mechanism to write the data into the unrecorded physical sector; and

 (f) when it is determined that the logical sector specified by the write instruction corresponds to a recorded physical sector, controlling the drive
30 mechanism to write the data into a physical sector indicated by a next writable address within the track determined in the step (c), generating a remapping table including remapping information which remaps an original address of the recorded physical sector to a remapping address of the

physical sector indicated by the next writable address, and controlling the drive mechanism to write the remapping table on the write-once disc.